

REMARKS

Claims 1 to 20 are currently pending in the present application. Claims 13-20 have been added. No new matter is added.

Claims 1 to 12 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Beier in view of US 4,709,385 by Pfeiler, et al. The Office Action asserts that Beier discloses a number of the limitations but does not disclose the use of memory to store the previous images with the phase motion. Applicants respectfully point out that Beier alone, or in combination with Pfeiler fail to disclose or suggest the features of claims 1-12. Applicants further point out that the Office Action has not addressed the patentability of either claims 4 or 5 and has also failed to point out any motivation for the modification of Beier. "The TSM test, flexibly applied, merely assures that the obviousness test proceeds on the basis of evidence – teachings, suggestions (a tellingly broad term), or motivations (an equally broad term) – that arise before the time of invention as the statute requires." Ortho-McNeil Pharmaceutical, Inc. v. Mylan Laboratories 2007-1223 p. 11 (Fed. Cir. March 31, 2008)

Beier is directed to digital subtraction angiography (DSA) which utilizes "a matrix of displacement vectors [] calculated based on the movements of small image regions of the two images." (Beier p. 106, par. 3). Beier utilizes cross-correlation to calculate a degree of congruence between "the original template in the native image and the pertaining 121 templates in the contrast medium image." (Beier p. 106, par. 4). Specifically, Beier discloses utilizing a cost function K for the comparison where K is defined as follows:

$$K_{x,y} = \sum_x \sum_y \left[\left(f_{CM}(x_0+x, y_0+y) - f_{Native}(x_0+x, y_0+y) \right)^2 \right]$$

$K_{x,y}$: cost function at template position x, y
 f_{CM}, f_{Native} : image function of CM resp. native image
 x_0, y_0 : coordinate of base point
 x, y : shift of template
 x, y : for all points of template

Beier does not disclose or suggest the features of claims 1-10 of calculating a similarity measure between the current image and a representative image where the similarity measure is associated with the phase of motion, calculating the similarity measure between the representative image and the previous images or a sub-quantity thereof, and selecting those previous images whose similarity measure relative to the representative image lies in a predetermined range around the similarity measure of the current image relative to the representative image. Beier also does not disclose or suggest the features of claims 11-12 which include the controller calculating first and second similarity measurements between the current image and the previous images where the first similarity measurement is associated with a phase of one of the cardiac or respiratory motions and the second similarity measurement is associated with a phase of the other of the cardiac or respiratory motions; the controller selecting a first sub-quantity of the previous images based on the first similarity measurement; and the controller selecting an image from the first sub-quantity based on the second similarity measurement.

Pfeiler is directed to an x-ray diagnostics installation for subtraction angiography that has an image memory connected to an output of an x-ray image intensifier video chain which has a number of addresses for storing individual x-ray video signals obtained during a dynamic body cycle of a patient under observation. Pfeiler uses a differencing unit to receive stored signals from the image memory as well as current video signals and then subtracts those signals to form a superimposed image. In Pfeiler, the entry and readout of signals to and from the image memory is under the command of a control unit

which is connected to the patient through an EKG circuit for identifying selected occurrences in the body cycle under observation so that the entry and readout of data from the image memory is thereby controlled in synchronization with the selected occurrences in the cycle. Pfeiler does not disclose or suggest the features of claims 1-10 or 11-12 described above.

Claims 13-19 and 20 depend from claims 11 and 9, respectively, and thus are also patentable over the cited combination of art.

In view of the foregoing, Applicants respectfully submit that the specification, the drawings and all claims presented in this application are currently in condition for allowance. Accordingly, Applicants respectfully request favorable consideration and that this application be passed to allowance.

Should any changes to the claims and/or specification be deemed necessary to place the application in condition for allowance, the Examiner is respectfully requested to contact the undersigned to discuss the same.

Dated: _____

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Respectfully submitted, 

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